Zion-Mount Carmel Highway, 62' Concrete
Arch Pine Creek Bridge
(Zion-Mount Carmel Highway, Clear Creek Bridge)
Spanning Clear Creek Gully at milepoint 42.88 State Route 9
Zion National Park
Vicinity of Springdale
Washington County
Utah

HAER No. UT-39-E

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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
Rocky Mountain Regional Office
National Park Service
P.O. Box 25287
Denver, Colorado 80225-0287

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HISTORIC AMERICAN ENGINEERING RECORD

ZION-MT. CARMEL HIGHWAY, 62' CONCRETE ARCH PINE CREEK BRIDGE (ZION-MT. CARMEL HIGHWAY, CLEAR CREEK BRIDGE)

HAER No. UT-39-E

I. INTRODUCTION

Location:	Spanning Clear Creek Gully at milepoint 42.88 on the Zion-Mt. Carmel Highwey, State Route 9, 1.9 miles from the east boundary of Zion National Park. Springdale vicinity, Washington County, Utah.
Qued:	Springdale East, Utah
UTM:	12/331930/4121100
Date of Construction:	1930
Present Owner:	State of Utah
Present Use:	Vehicular bridge
Significance:	The development of the Zion-Mt. Carmel Highway was significant to the development of the National Parks in Utah and Arizona. The Bureau of Public Roads constructed the 62' Concrete Arch Pine Creek Bridge as part of the Zion-Mt. Carmel Highway. Access to the four parks in this area, Bryce Canyon, Grand Canyon, Cedar Breaks and Zion National Park was greatly improved with the building of the highway. Each component of the highway system is important as it relates to the development of this area and tourism as a major industry in Utah and Arizona. Due to the rugged terrain in Zion National Park, each bridge and tunnel was integral to the highway's completion.
Historian:	Julie W. Osborne. Office of Burtch W. Beall, Jr., FAIA, Architect, Salt Lake City, Utah. December 1992.

II. HISTORY

A. NEED FOR HIGHWAY

Tourism and travel to Zion National Park doubled from 1919 to 1920, increasing to more than 55,000 visitors by 1930.[1] Along with the development of Bryce Canyon, Cedar Breaks and the Grand Canyon, transportation between the parks became an increasingly pressing matter. Meeting the transportation needs of tourists in southern Utah was difficult.

> By 1923, passable auto roads reached Zion, Kaibab, North Rim, Bryce Canyon, and Cedar Breaks, but some of the routes were circuitous and it required a great deal of extra travel to make the loop. Thus the road from LaVerkin to Zion had to be retraced in order to go from Hurricane to Pipe Springs, while to reach Cedar Breaks a special side trip was necessary from either Perowan or Cedar City, and to get back to Cedar City from Bryce required a routing through Panguitch and Paragoneh. Popular demand was growing for shorter and more direct routes as well as for better roads.[2]

The problem, as described by Howard Means, Utah State Road Engineer, was the connection between highways 89 and 91. (Today, Interstate 15 follows the same route as the old highway 91.) These two highways travelled north and south through Utah, but on opposite sides of a mountain range; highway 89 was on the eastern side, and highway 91 on the west. At the time, there were two connecting routes between the highways. The connection to the north of the parks was Bear Valley road, which ran southeast from Paragonah, over a high summit, to Alton. However, this route was only open for travel during the summer, with severe weather conditions making travel impossible in the winter. The southern connection between highways 89 and 91 was equally undesirable, which required traveling through northern Arizona, from Freedonia to Hurricane. According to Means, this route was unacceptable travel for tourists, since it required travel of an extra 175 miles in order to visit all three parks, Zion, Cedar Breaks and Bryce.[3]

The Federal Bureau of Public Roads wished to eliminate the detour, and the search for a connecting link became a priority. In 1923, a study of the area was initiated by the Federal Bureau of Public Roads and the Utah State Road Commission, and with the help of the House Committee for the National Park Service[4], the determination was made to build the Zion-Mt. Carmel Highway.

B. DEVELOPMENT OF THE ZION MT.-CARMEL HIGHWAY

B. J. Finch, Bureau of Public Roads, end Howard C. Means, were essigned to determine the passage for a road through Zion National Perk. John Winder, a rancher and pionaar of the uplands on the east rim of Zion National Park,[5] helped to determina the proposed route. Exploration by Finch, Means end Winder required a journey on horseback through the rugged terrain, camping and hiking, and, whare "it was necessery to get around ... send ledges two or three inches wide",[6] scrambling to reach the top of the summit so they could observe tha area to the west. During this expedition, Finch, Means and Winder determined the route that would evolve into the Zion-Mt. Carmel Highway.

The September 26, 1925 Salt Lake Tribune described the implications of tha Zion-Mt. Carmel Highway:

> . . . the proposed automobile highway will rival in construction enything along the famed Columbia rivar highway, while the scenery it traverses will be something without parellel and such as hitherto has bean possible only by a trip on horseback. The completion of this road will make it possible to enjoy these wondars whila seated in an automobile and on a good, sefe road with a steady grade, but only a few feet of it in excess of 6 per cent. As a tourist ettrection, therefore, the road should hava a wonderful value.
>
> It will also have important economic use to Kane county and part of the Arizona "strip", north of the Kaibab forest. At present that ragion can reach the railhead et Cedar City for three or four months in summer, over the Cedar Long Velley route. In winter it has been necessary to make e tedious detour through tha Arizona desert to Hurricane.[7]

After four years of planning, a 25 mile road was designed to link the National Perk and Mt. Carmel, with 15-1/2 miles of the road outside the Park. The state, with federal aid, would build the 15-1/2 mile stretch. Congress appropriated additional funds for the Bureau of Public Roads to build tha 8-1/2 miles inside the National Park, at a cost of approximately $1,500,000.[8] The 8-1/2 miles inside the perk included the mile-long Zion-Mt. Carmel Tunnel, and a second 480' tunnel.

The Neveda Contracting Compeny of Fallon, Nevade contracted with the National Park Service to construct the highway. Work began on September 27, 1928 with two crews: a road crew to construct the switchbacks and a mining crew to build the Zion-Mt. Carmel Tunnel. The process of building this extraordinary tunnel required elaven months end twelve deys to blast through the mountain and make cuts in the slickrock country.[9]

Four bridges were constructed within the National Park section of the Zion-Mt. Carmel Highway. The Reynolds-Ely Construction Company of Springvilla, Utah, constructed

the bridges, and Ore Bundy Construction of Ogden provided the paving and finish work. These features of tha Zion-Mt. Cermel Highway combined to maka it "one of the most spectacular enginearing feats in the history of road-building within the Rocky Mountain Region of the National Park Service."[10]

III. 62' CONCRETE ARCH PINE CREEK BRIDGE (CLEAR CREEK BRIDGE)

Tha 62' Concrete Arch Pina Creak Bridge (Clear Craak Bridge) is located at milepoint 42.88 on the Zion Mt.-Carmel Highway. The name "62' Concrete Arch Pina Creek" appears on the original drawings, but the common name of the structura is Clear Creek Bridge. Howerd Means did not discuss this name change directly, but ha did provide information on the connection between Clear Creek end Pine Creek. Meens concluded that tha first meps of the area wara inaccurate because the tarrain was too rugged for anyone to determina the exect courses of these two creeks. These maps showed Claar Creek and Pina Creek to be two distinct streams. Pine Craak was balievad to be about two miles long and flowed westerly into the north fork of the Virgin River, near the antrance of Zion Canyon. The head of Pine Creak was considared to be a parpendiculer rock wall a few miles east of Zion Canyon, near what is today callad the Great Arch. Clear Creak began fer to the east of Pine Creek, near Orderville, flowing wasterly for a stretch and then turning south to meat the south fork of tha Virgin River. Howavar, when Means, Firth and Windar were surveying the Pine Creek area, thay perilously climbed up tha Great Arch, being rewerdad with a penoramic vlaw of the region. From this ventaga point, thesa men looked westerly, saeing Pine Craek empty into tha north fork of tha Virgin River. Looking to the east, over the ruggad terrain towerd Orderville, these man ware surprisad to sea that Clear Creek did not tum south, but continued to flow west and connected with Plna Creek. Thus, Plna Creek and Clear Creak ware actually the same stream.[11] Today, tha westem portion of this stream, from the Great Arch to the Virgin River, is still callad Pina Creek, whila the eastam portion is refarred to as Clear Creek. As a consequanca of this naming, tha 62' Concrete Arch Pina Creak Bridga mey hava bean renamed whan the bridge (UT-39-B) over what is today called Pine Craak was completed in 1930.[12] However, no documantation has been found to support this assumption.

The 62' Concrete Arch Pina Creak Bridge (Clear Creek Bridge) is a concrete arch bridge with a girder and floorbeam system. Tha deck structura is cast-in-place concreta. Built in 1930, tha bridge possesses two continuous arch ribs spanning 66 feet with a rise of 13 feat 3 inches. Tha entire bridga is 99 feat long, with a roadway width of 20 feet end a deck width of 23.2 feet. The cast concrata, gothic archad railing has a continuous concrete cap and features recessed exposed aggregate and panels. Tha construction of the bridga requirad 178 cubic yards of class A concrete, 1121 sacks of cement, 78-1/2 cubic yerds of sand, 153-1/2 cubic yards of gravel and over 43,000 pounds of reinforcing steel.[13] The designer is listed by tha initials J.J.B. on the original drawings. Thera are 2" x 2" negatives of the original construction drewings on file at tha Utah Departmant of Transportation.

Thara have been no major changes or altarations in the bridge. Tha bridge is in usa even though tha status of tha bridga is currently listed es functionally obsolete.[14]

IV. PROJECT INFORMATION

This Historic American Engineering Record (HAER) recording project was required as mitigation for the removal and replacement of the bridge. Julie Osborne, under the direction of Burtch W. Beall, Jr., FAIA, Architect, was responsible for researching end writing histories for Clear Creek Bridge, Co-op Creek Bridge, and the Short Tunnel in Zion Netional Perk. This report wes prepered during the winter of 1992.

V. ENDNOTES

1. Angus M. Woodbury, A History of Southern Utah and Its National Parks (Salt Lake City, Utah: By the Author, 1950), p. 203.

2. Ibid, p. 204-205.

3. Howard C. Means, "Autobiography of Howard C. Means" (Salt Lake City, Utah: Dictated for the files of the Utah State Historical Society, 1947-48).

4. Woodbury, A History of Southern Utah and Its National Parks, p. 205.

5. "Shorter Park Road Proposed", Salt Lake Tribune, 26 June 1923.

6. Means, "Autobiography of Howard C. Means".

7. "Proposed Road From Zion Perk Would Be Valuable", Salt Lake Tribune, 26 September 1925.

8. Ibid.

9. Donald T. Gerate, The Zion Tunnel, From Slickrock to Switchback (Springdale, Utah: Zion Natural History Association, Inc., 1989), p. 39.

10. Jim Jurale and Nancy Witherall, "Multiple Resources for Zion National Park", National Register of Historic Places Inventory (Selt Lake City, Uteh: Utah State Historic Preservetion Office, 1987), Item 8, Pege 6.

11. Means, "Autobiography of Howerd C. Meens".

12. Jim Jurale end Nancy Witherall, "Multiple Resources for Zion National Park", Item 7, Page 8.

13. Negatives of Original Construction Drawings, "62' Concrete Arch Pine Creek" (Salt Lake City, Utah: Utah Department of Trensportation).

14. Structural Inventory end Appreisal Sheet, Nationel Bridge Inventory (Salt Lake City, Utah: Utah Department of Transportation, 3/27/92).

VI. BIBLIOGRAPHY

A. BOOKS

Garate, Donald T. The Zion Tunnel, From Slickrock to Switchback. Springdale, Utah: Zion Natural History Association, Inc., 1989.

Woodbury, Angus M. A History of Southern Utah and Its National Parks. Salt Lake City, Utah: By the Author, 1950.

B. NEWSPAPERS

Salt Lake Tribune, 26 September 1925, "Proposed Road From Zion Park Would Be Valuable".

Salt Lake Tribune, 26 June 1923, "Shorter Park Road Proposed".

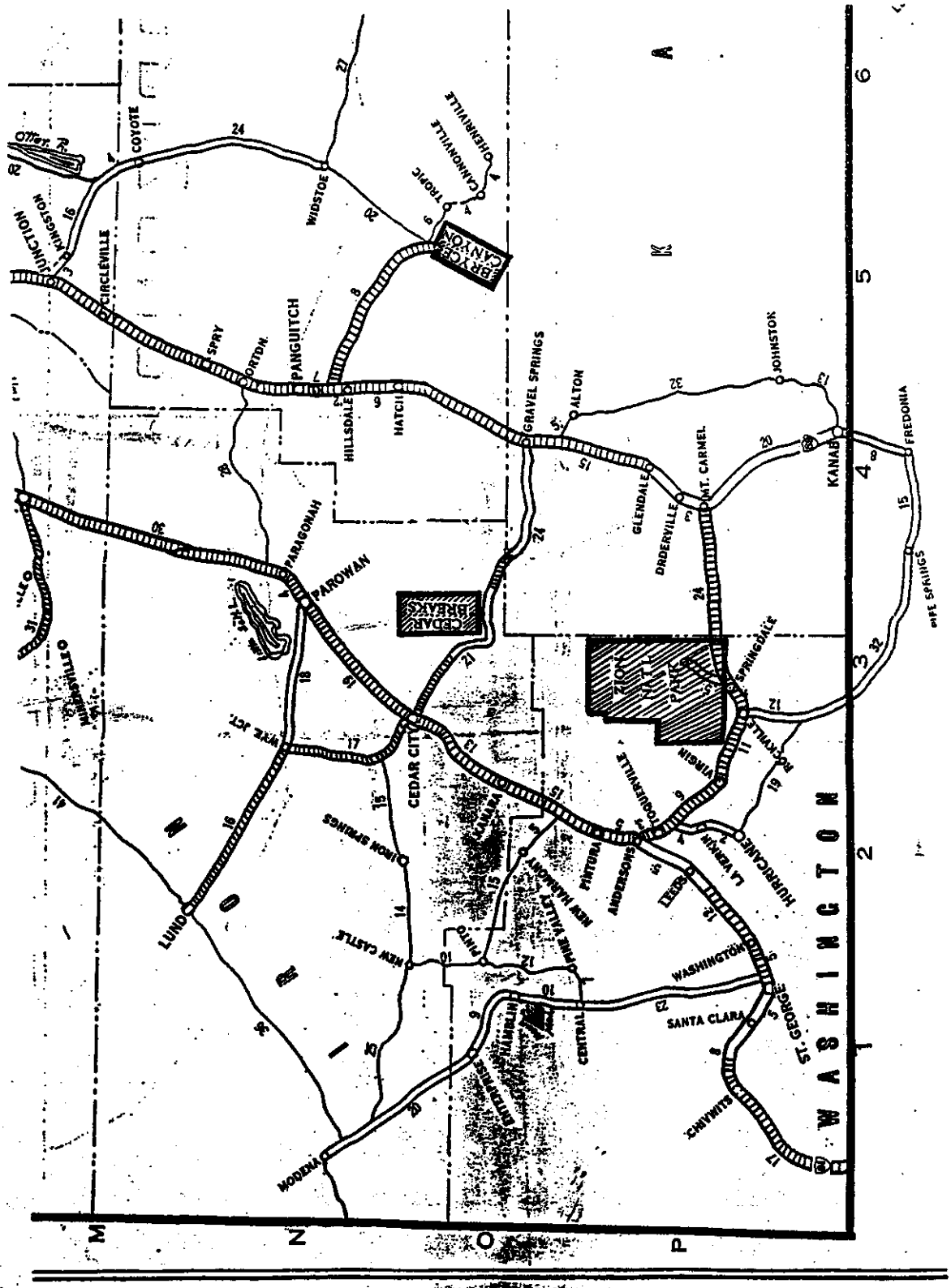
C. MISCELLANEOUS

Jurale, Jim and Witherall, Nancy. "Multiple Resources for Zion National Park". National Register of Historic Places Inventory. Salt Lake City, Utah: Utah State Historic Preservation Office, 1987.

Means, Howard C. "Autobiography of Howard C. Means". Salt Lake City, Utah: The Utah State Historical Society, 1947-48.

Negatives of Original Construction Drawings, "62' Concrete Arch Pine Creek". Salt Lake City, Utah: Utah Department of Transportation.

Structural Inventory and Appraisal Sheet, National Bridge Inventory. Salt Lake City, Utah: Utah Department of Transportation, 3/27/92.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WIDSTOE
CLAMMONVILLE
OHERRIVILLE
TROPIC
BRYCE CANYON
SPRY
ORTON
PANGUITCH
HILLSDALE
HATCH
GRAVEL SPRINGS
ALTON
JOHNSTON
GLENDALE
ORDERVILLE
MT. CARMEL
KANAB
FREDONIA
PIPE SPRINGS
PARAGONAH
PAROWAN
CEDAR BREAKS
CEDAR CITY
SPRINGDALE
ZION NATIONAL PARK
ROCKVILLE
VIRGIN
TOQUERVILLE
HURRICANE
LA VERKIN
SNOWVILLE
PINTURA
ANDERSONS
NEW HARMONY
PINTO
NEW CASTLE
LUND
IRON SPRINGS
WASHINGTON
SANTA CLARA
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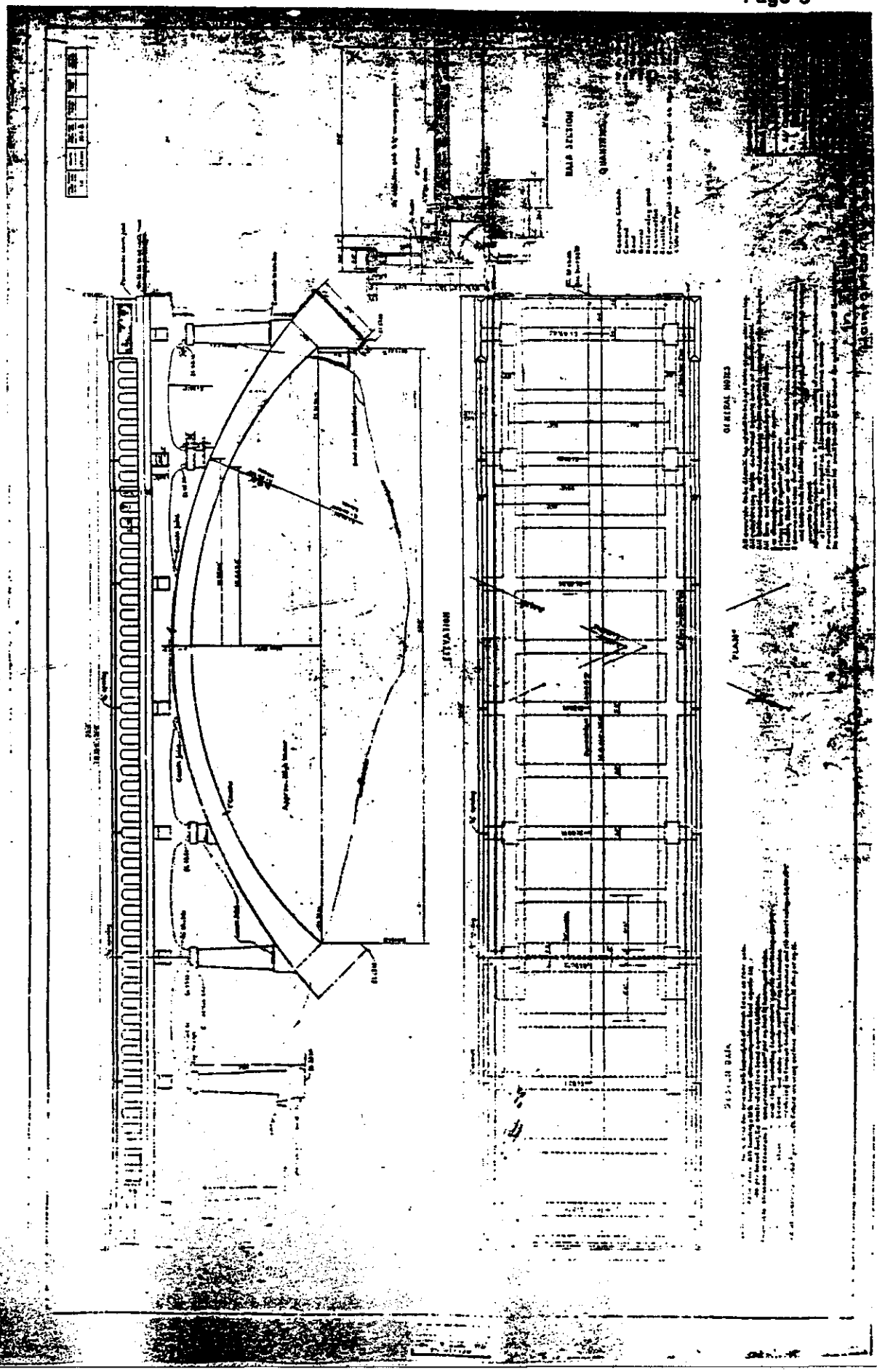
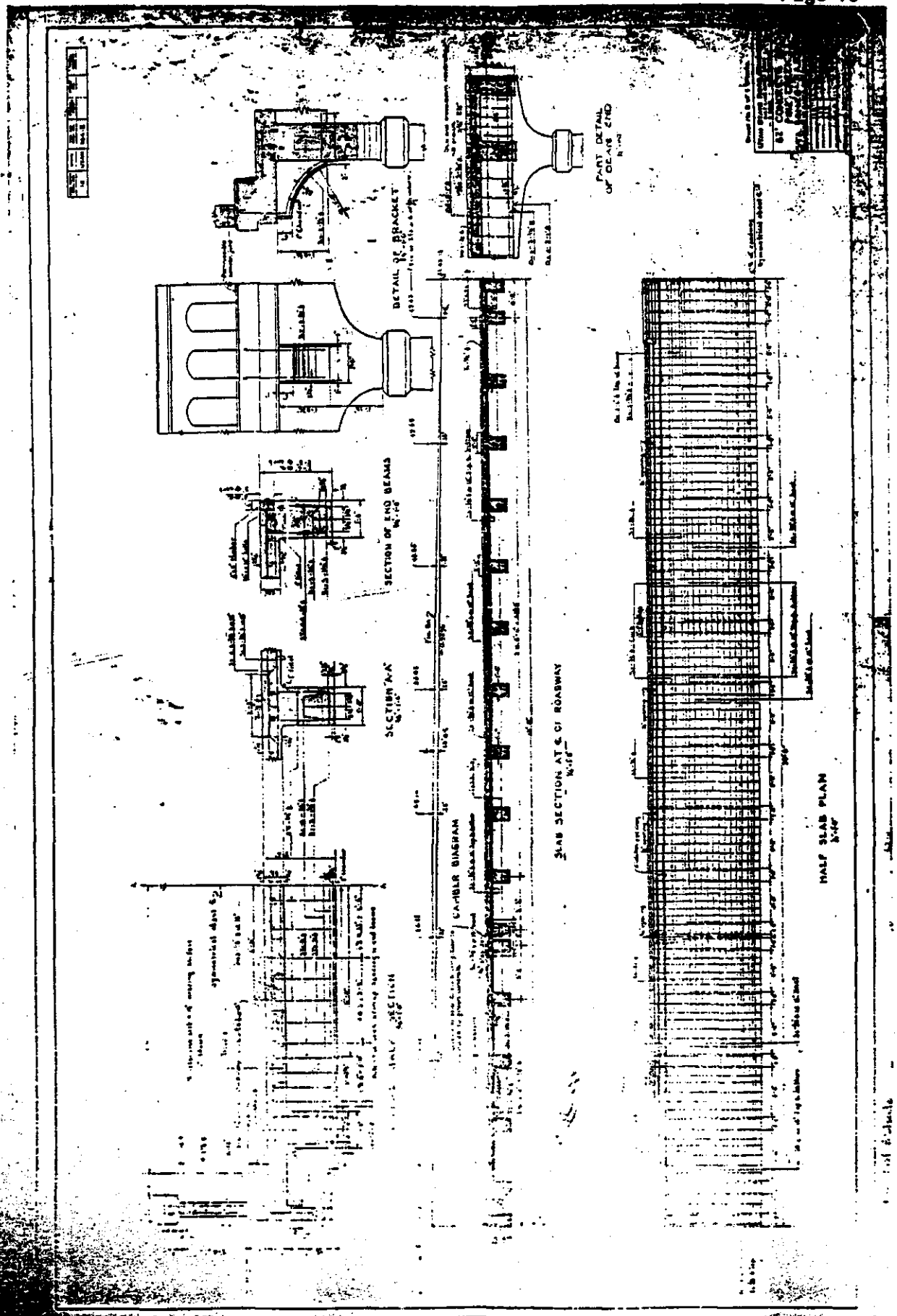
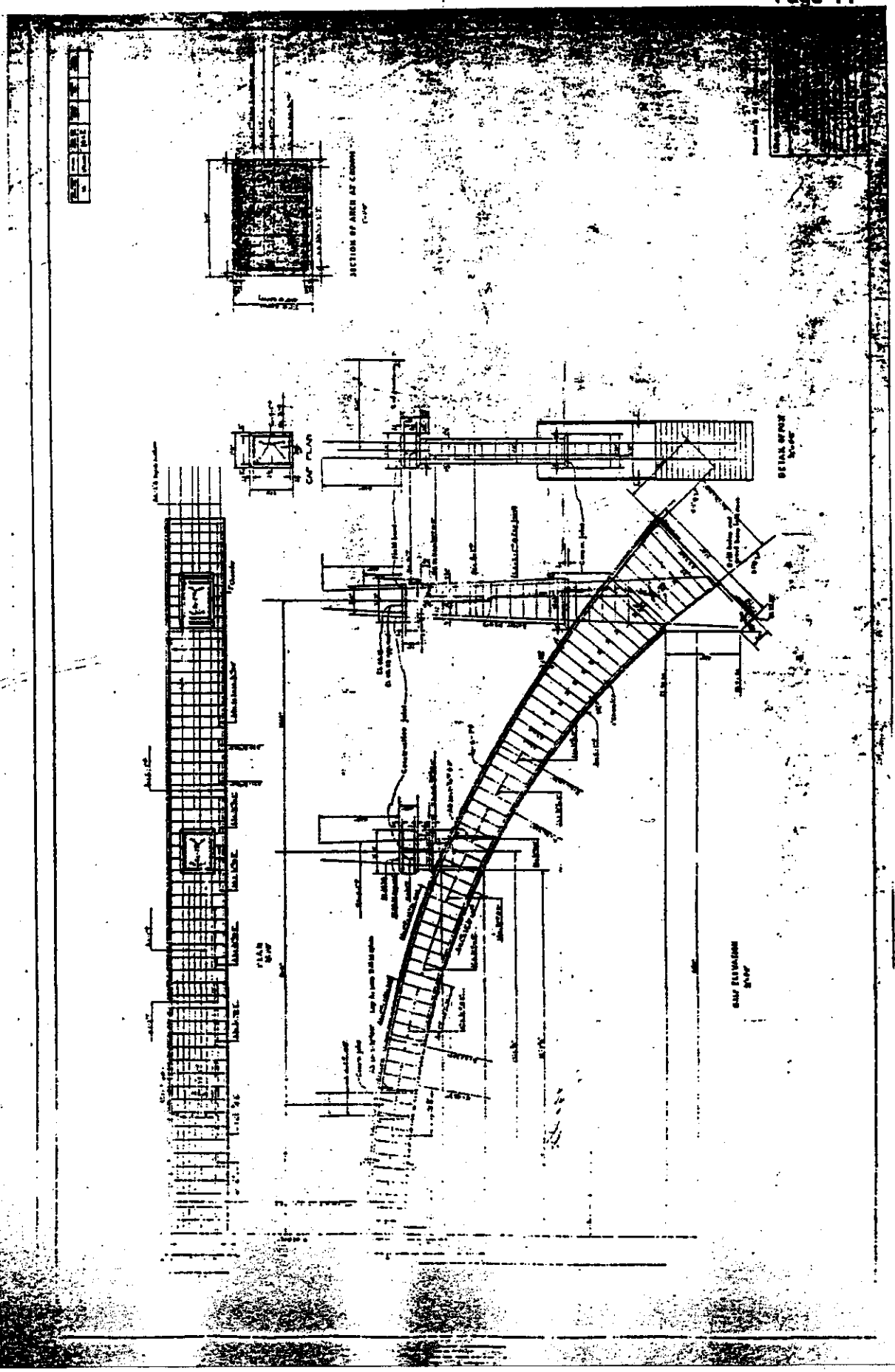
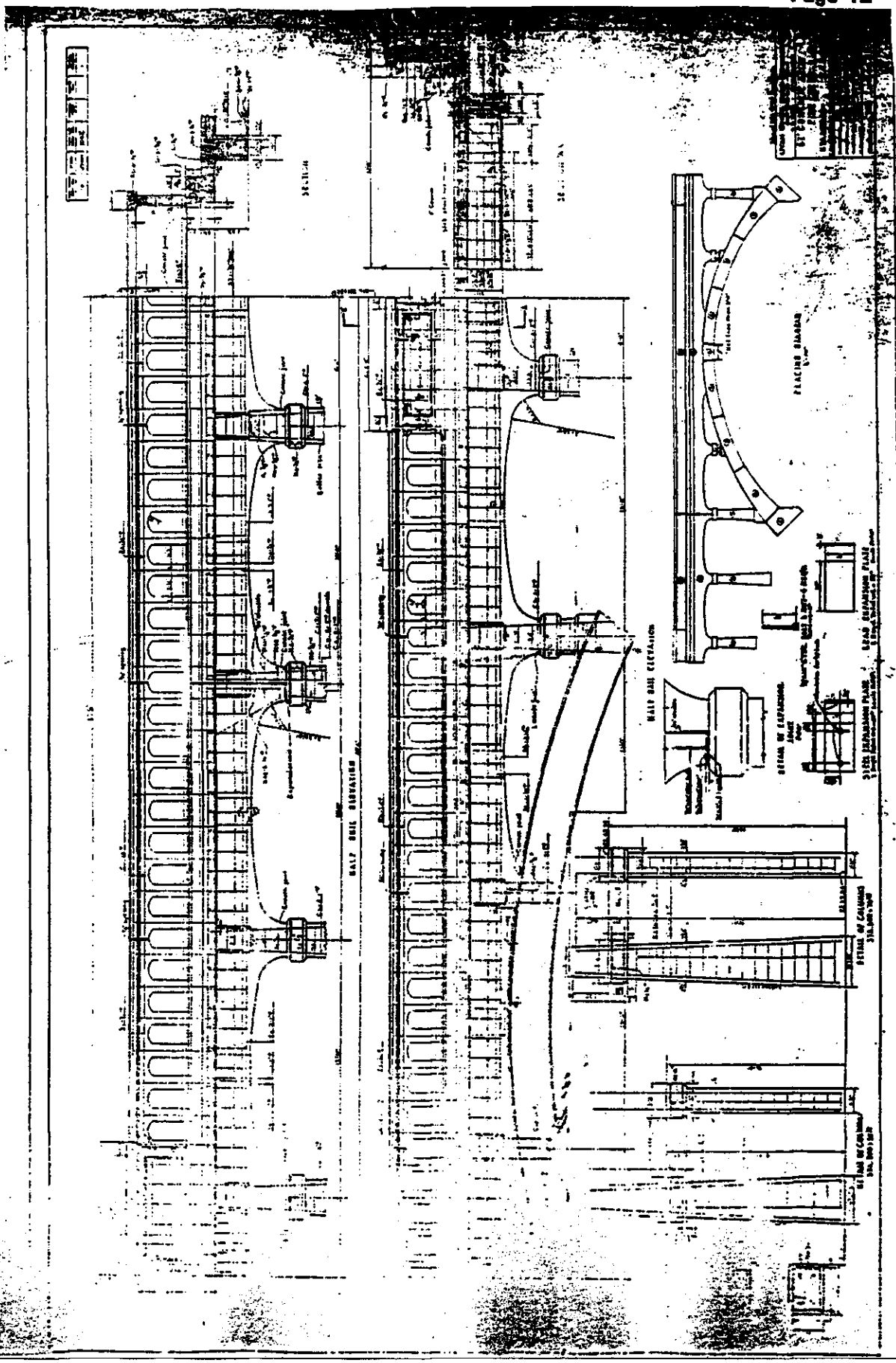



DETAIL OF BRACKET
PART DETAIL OF CURB END
SECTION OF END BEAMS
SECTION A-A
CAMBER DIAGRAM
SLAB SECTION AT C.L. ROADWAY
HALF SLAB PLAN





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Spanning Clear Creek gully at milepost 42.8 Zion-Mount Carmel Highway
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ADDENDUM TO
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